Claims

[c1]   An apparatus for detecting physical marks from a wobble signal, comprising:

a matching value operation unit having a matched result produced by matching a wobble signal with a matching reference signal and thus outputting a matched signal according to the matched result; and

a physical mark indicator for designating one of at least two signal process criteria to process the matched signal according to the status of the wobble signal and thus outputting a physical mark indication signal.

[c2]   The apparatus for detecting physical marks from a wobble signal of Claim 1, wherein the at least two signal process criteria each employs a different threshold value to compare with the matched signal so as to output the physical mark indication signal.

[c3]   The apparatus for detecting physical marks from a wobble signal of Claim 1, wherein the at least two signal process criteria each employs a different offset value to synthesize with the matched signal, and all the synthesized signals are compared with a threshold value before the physical mark indication signal is output.

[c4] The apparatus for detecting physical marks from a wobble signal of Claim 1, wherein the at least two signal process criteria simultaneously and respectively employ different threshold values to compare with the matched signal, and one of the compared signals is designated as the physical mark indication signal.

[c5] The apparatus for detecting physical marks from a wobble signal of Claim 1, wherein the at least two signal process criteria simultaneously and respectively employ different threshold values to compare with the matched signal, each of the compared signals is through the operation of a logical combination, and one of the processed signals after the operation is designated as the physical mark indication signal according to the status of the wobble signal.

[c6] The apparatus for detecting physical marks from a wobble signal of Claim 1, wherein the at least two signal process criteria each employs a different offset value to synthesize with the matched signal, and one of the synthesized signals is designated as the physical mark indication signal.

[c7] An apparatus for detecting physical marks from a wobble signal, comprising:
a matching value operation unit having a matched result

produced by matching a wobble signal with a matching reference signal and thus outputting a matched signal according to the matched result; and

a physical mark indicator for designating one of at least two threshold values according to the status of the wobble signal and comparing the designated threshold value with the matched signal so as to output a physical mark indication signal.

[c8]   The apparatus for detecting physical marks from a wobble signal of Claim 7, wherein the physical mark indicator includes:

a comparator for comparing the designated threshold value with the matched signal so as to output the physical mark indication signal; and

a threshold value generator for selecting the designated threshold value from a plurality of threshold values according to the status of the wobble signal.

[c9]   The apparatus for detecting physical marks from a wobble signal of Claim 7, wherein the physical mark indicator includes:

a comparator for comparing the designated threshold value with the matched signal so as to output the physical mark indication signal;

a position unit for specifying where the current physical mark indication signal is in the structure of wobble data

and thus outputting a positioned signal; and

a threshold value generator for selecting the designated threshold value from a plurality of threshold values according to the positioned signal.

[c10] The apparatus for detecting physical marks from a wobble signal of Claim 9, wherein the position unit figures out the interval between the specified position of the current physical mark indication signal and the detected position of a previous detected physical mark.

[c11] The apparatus for detecting physical marks from a wobble signal of Claim 9, further comprising a decoding module for converting the physical mark indication signal into wobble data with physical address information.

[c12] The apparatus for detecting physical marks from a wobble signal of Claim 11, wherein the decoding module includes:

a decoding reference unit for continuously collecting the physical mark indication signal till the collected signal length is decodable according to output signals from the position unit; and

a decoder for converting the physical mark indication signal with a decodable length into the wobble data.

[c13] The apparatus for detecting physical marks from a wob-

ble signal of Claim 12, wherein the decoding module further includes:

a decoding status unit for sending the status of the wobble data back to the physical mark indicator.

[c14] The apparatus for detecting physical marks from a wobble signal of Claim 11, wherein the decoding module includes:

a decoding reference unit for continuously collecting the processing result of the matched signal from the matching value operation unit till the collected signal length is decodable, wherein the processing is according to output signals from the position unit; and

a decoder for converting the processing result with a decodable length into the wobble data.

[c15] The apparatus for detecting physical marks from a wobble signal of Claim 14, wherein the decoding module further includes:

a decoding status unit for sending the status of the wobble data back to the physical mark indicator.

[c16] The apparatus for detecting physical marks from a wobble signal of Claim 11, wherein the wobble data is an ADIP address word.

[c17] The apparatus for detecting physical marks from a wob-

ble signal of Claim 7, wherein the physical mark indicator designates the threshold value according to the position of the wobble signal.

[c18]   The apparatus for detecting physical marks from a wobble signal of Claim 17, wherein the position is where the wobble signal is in the structure of the wobble data.

[c19]   The apparatus for detecting physical marks from a wobble signal of Claim 17, wherein the position is a wobble length number of the wobble signal which appears in the structure of the wobble data.

[c20]   The apparatus for detecting physical marks from a wobble signal of Claim 17, wherein the position is an ADIP unit number of the wobble signal which appears in the structure of the wobble data.

[c21]   The apparatus for detecting physical marks from a wobble signal of Claim 17, wherein the position is an ADIP unit number and a wobble length number of the wobble signal which appears in the structure of the wobble data.

[c22]   The apparatus for detecting physical marks from a wobble signal of Claim 19, wherein the physical mark indicator separately designates a threshold value in accordance with odd and even wobble length numbers.

[c23] The apparatus for detecting physical marks from a wobble signal of Claim 19, wherein the physical mark indicator separately designates a threshold value in accordance with at least one group of the specified wobble length numbers and a group of the other unspecified wobble length numbers.

[c24] The apparatus for detecting physical marks from a wobble signal of Claim 17, wherein the physical mark indicator designates a threshold value with a lower qualification in accordance with the wobble length numbers where the physical marks more possibly exist.

[c25] The apparatus for detecting physical marks from a wobble signal of Claim 19, wherein the physical mark indicator designates a threshold value in accordance with the wobble length numbers where a sync mark is existent.

[c26] The apparatus for detecting physical marks from a wobble signal of Claim 21, wherein the physical mark indicator separately designates a threshold-value choosing rule in accordance with the ADIP unit numbers where a sync unit is existent.

[c27] The apparatus for detecting physical marks from a wobble signal of Claim 21, wherein the physical mark indicator separately designates a threshold-value choosing

rule in accordance with at least one group of the specified ADIP unit numbers and a group of the other unspecified ADIP unit numbers.

[c28]   The apparatus for detecting physical marks from a wobble signal of Claim 7, wherein the wobble signal is read from a Blu-ray disc, a DVD+RW disc or an HD DVD disc.

[c29]   An apparatus for detecting physical marks from a wobble signal, comprising:
a matching value operation unit for performing a comparison between a wobble signal and a normal clock signal or a specific matching reference signal so as to output a matched signal according to the comparison;
a threshold value generator for designating one of at least two threshold values according to the status of the wobble signal; and
a comparator for comparing the designated threshold value with the matched signal so as to output a physical mark indication signal.

[c30]   The apparatus for detecting physical marks from a wobble signal of Claim 29, further comprising a position unit for specifying where the current physical mark indication signal is in the structure of wobble data and thus outputting a positioned signal to trigger the threshold value generator to designate the threshold value.

[c31] The apparatus for detecting physical marks from a wobble signal of Claim 30, further comprising:

a decoding reference unit for continuously collecting the physical mark indication signal till the collected signal length is decodable according to output signals from the position unit; and

a decoder for converting the physical mark indication signal with a decodable length into the wobble data with physical address information.

[c32] The apparatus for detecting physical marks from a wobble signal of Claim 31, wherein the decoding module further includes:

a decoding status unit for sending the status of the wobble data back to the position unit.

[c33] The apparatus for detecting physical marks from a wobble signal of Claim 30, further comprising:

a decoding reference unit for continuously collecting the processing result of the matched signal from the matching value operation unit till the collected signal length is decodable, wherein the processing is according to output signals from the position unit; and

a decoder for converting the processing result with a decodable length into the wobble data with physical address information.

[c34] The apparatus for detecting physical marks from a wobble signal of Claim 33, wherein the decoding module further includes:
a decoding status unit for sending the status of the wobble data back to the position unit.

[c35] The apparatus for detecting physical marks from a wobble signal of Claim 30, wherein the wobble data is an ADIP address word.

[c36] The apparatus for detecting physical marks from a wobble signal of Claim 29, wherein the physical mark indicator designates the threshold value according to the position of the wobble signal.

[c37] The apparatus for detecting physical marks from a wobble signal of Claim 36, wherein the position is a wobble length number of the wobble signal which appears in the structure of the wobble data.

[c38] The apparatus for detecting physical marks from a wobble signal of Claim 36, wherein the position is an ADIP unit number of the wobble signal which appears in the structure of the wobble data.

[c39] The apparatus for detecting physical marks from a wobble signal of Claim 36, wherein the position is an ADIP unit number and a wobble length number of the wobble

signal which appears in the structure of the wobble data.

[c40] The apparatus for detecting physical marks from a wobble signal of Claim 37, wherein the physical mark indicator separately designates a threshold value in accordance with odd and even wobble length numbers.

[c41] The apparatus for detecting physical marks from a wobble signal of Claim 37, wherein the physical mark indicator separately designates a threshold value in accordance with at least one group of the specified wobble length numbers and the group of the other unspecified wobble length numbers.

[c42] The apparatus for detecting physical marks from a wobble signal of Claim 37, wherein the physical mark indicator designates a threshold value with a lower qualification in accordance with the wobble length numbers where the physical marks more possibly exist.

[c43] The apparatus for detecting physical marks from a wobble signal of Claim 37, wherein the physical mark indicator designates a threshold-value with a lower qualification in accordance with the wobble length numbers where a sync mark is existent.

[c44] The apparatus for detecting physical marks from a wobble signal of Claim 39, wherein the physical mark indica-

tor separately designates a threshold-value choosing rule in accordance with the wobble length numbers where a sync unit is existent.

[c45]   The apparatus for detecting physical marks from a wobble signal of Claim 39, wherein the physical mark indicator separately designates a threshold-value choosing rule in accordance with at least one group of the specified ADIP unit numbers and a group of the other unspecified ADIP unit numbers.

[c46]   The apparatus for detecting physical marks from a wobble signal of Claim 29, wherein the wobble signal is read from a Blu-ray disc, a DVD+RW disc or an HD DVD disc.

[c47]   An apparatus for detecting physical marks from a wobble signal, comprising:
a matching value operation unit having a matched result produced by matching a wobble signal with a matching reference signal to find out their waveform differences and thus outputting a matched signal according to the matched result; and
a physical mark indicator for designating one of at least two offset values according to the status of the wobble signal and synthesizing the designated offset value with the matched signal and later comparing the synthesized signal with a threshold value so as to output a physical

mark indication signal.

[c48] The apparatus for detecting physical marks from a wobble signal of Claim 47, further comprising a decoding module for converting the physical mark indication signal into wobble data with physical address information.

[c49] The apparatus for detecting physical marks from a wobble signal of Claim 47, wherein the offset values separately weigh the position of the wobble signal where a physical mark more possibly exists.

[c50] An apparatus for detecting physical marks from a wobble signal, comprising:
a matching value operation unit having a matched result produced by matching a wobble signal with a matching reference signal and thus outputting a matched signal according to the matched result; and
a physical mark indicator simultaneously employing at least two threshold values to respectively compare with the matched signal and designating one of the compared signals as a physical mark indication signal.

[c51] The apparatus for detecting physical marks from a wobble signal of Claim 50, wherein the physical mark indicator designates the compared signal as the physical mark indication signal according to the position of the wobble

signal.

[c52] The apparatus for detecting physical marks from a wobble signal of Claim 51, wherein the position is where the wobble signal is in the structure of the wobble data.

[c53] The apparatus for detecting physical marks from a wobble signal of Claim 51, wherein the position is a wobble length number of the wobble signal which appears in the structure of the wobble data.

[c54] The apparatus for detecting physical marks from a wobble signal of Claim 51, wherein the position is an ADIP unit number of the wobble signal which appears in the structure of the wobble data.

[c55] The apparatus for detecting physical marks from a wobble signal of Claim 51, wherein the position is an ADIP unit number and a wobble length number of the wobble signal which appears in the structure of the wobble data.

[c56] The apparatus for detecting physical marks from a wobble signal of Claim 53, wherein the physical mark indicator separately designates one of the compared signals as the physical mark indication signal in accordance with odd and even wobble length numbers.

[c57] The apparatus for detecting physical marks from a wob-

ble signal of Claim 53, wherein the physical mark indicator designates one of the compared signals as the physical mark indication signal in accordance with a group of the specified wobble length numbers and designates another one of the compared signals as the physical mark indication signal in accordance with a group of the other unspecified wobble length numbers.

[c58] The apparatus for detecting physical marks from a wobble signal of Claim 51, wherein the physical mark indicator designates one of the compared signals with a lower qualification as the physical mark indication signal in accordance with the wobble length numbers where the physical marks more possibly exist.

[c59] The apparatus for detecting physical marks from a wobble signal of Claim 53, wherein the physical mark indicator separately designates one of the compared signals as the physical mark indication signal in accordance with the wobble length numbers where a sync mark is existent.

[c60] The apparatus for detecting physical marks from a wobble signal of Claim 54, wherein the physical mark indicator separately designates one of the compared signals in accordance with the ADIP unit numbers where a sync unit is existent.

[c61]   The apparatus for detecting physical marks from a wobble signal of Claim 55, wherein the physical mark indicator designates one of the threshold value choosing rule in accordance with a group of the specified ADIP unit numbers and designates another threshold value choosing rule in accordance with a group of the other unspecified ADIP unit numbers.

[c62]   A method for detecting physical marks from a wobble signal, comprising the steps of:
computing a matched result produced by matching a wobble signal with a matching reference signal and thus outputting a matched signal according to the matched result; and
designating one of at least two signal process criteria to process the matched signal according to the status of the wobble signal and thus outputting a physical mark indication signal.

[c63]   The method for detecting physical marks from a wobble signal of Claim 62, wherein the at least two signal process criteria each employs a different threshold value to compare with the matched signal so as to output the physical mark indication signal.

[c64]   The method for detecting physical marks from a wobble signal of Claim 62, wherein the at least two signal pro-

cess criteria each employs a different offset value to synthesize with the matched signal so as to output the physical mark indication signal.

[c65] The method for detecting physical marks from a wobble signal of Claim 62, wherein the at least two signal process criteria simultaneously employs respective threshold values to compare with the matched signal and designates one of the compared signals as the physical mark indication signal.

[c66] The method for detecting physical marks from a wobble signal of Claim 62, wherein the at least two signal process criteria simultaneously and respectively employ different threshold values to compare with the matched signal, each of the compared signals are through operations of logical combination, and one of the signals after the operations is designated as the physical mark indication signal according to the status of the wobble signal.

[c67] The method for detecting physical marks from a wobble signal of Claim 63, wherein the threshold value is designated according to the position of the wobble signal.

[c68] The method for detecting physical marks from a wobble signal of Claim 67, wherein the position is a wobble length number of the wobble signal which appears in the

structure of the wobble data.

[c69] The method for detecting physical marks from a wobble signal of Claim 67, wherein the position is an ADIP unit number of the wobble signal which appears in the structure of the wobble data.

[c70] The method for detecting physical marks from a wobble signal of Claim 67, wherein the position is an ADIP unit number and a wobble length number of the wobble signal which appears in the structure of the wobble data.

[c71] The method for detecting physical marks from a wobble signal of Claim 68, wherein the threshold values are separately designated in accordance with odd and even wobble length numbers.

[c72] The method for detecting physical marks from a wobble signal of Claim 68, wherein the threshold values are separately designated in accordance with at least one group of the specified wobble length numbers and a group of the other unspecified wobble length numbers.

[c73] The method for detecting physical marks from a wobble signal of Claim 63, wherein the threshold value with a lower qualification is designated in accordance with the wobble length number where the physical mark more possibly exists.

[c74] The method for detecting physical marks from a wobble signal of Claim 62, further comprising a step of converting the physical mark indication signal into wobble data with physical address information.

[c75] The method for detecting physical marks from a wobble signal of Claim 68, wherein the physical mark indicator designates a threshold value with a lower qualification in accordance with the wobble length numbers where a sync mark is existent.

[c76] The method for detecting physical marks from a wobble signal of Claim 70, wherein the physical mark indicator separately designated a threshold-value choosing rule in accordance with the ADIP unit numbers where a sync unit is existent.

[c77] The method for detecting physical marks from a wobble signal of Claim 70, wherein the physical mark indicator separately designated a threshold-value choosing rule in accordance with at least one group of the specified ADIP unit numbers and a group of the other unspecified ADIP unit numbers.